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FOREST SURVEY RELEASE NO. 17

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FOREST STATISTICS FOR
THE HILL COUNTRY
OF OHIO

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U. S. DEPARTMENT OF AGRICULTURE

CENTRAL STATES
FOREST EXPERIMENT STATION

COLUMBUS, OHIO W. G. McGINNIES, DIRECTOR

UNITED STATES DEPARTMENT OF AGRICULTURE — FOREST SERVICE

FOREWORD

This is the second of two preliminary reports on the forest areas and timber volumes in Ohio. Forest statistics for western and northeastern Ohio were given in the first report. A third publication is being prepared presenting forest statistics for the whole State and including figures on timber growth and cut.

These releases are products of the Forest Survey of the Central States, an activity of the Central States Forest Experiment Station and a part of the nationwide survey of forest resources being made by the Forest Service, U. S. Department of Agriculture.

The Forest Survey in southern Ohio was expedited through the cooperation of public and private groups. The following organizations furnished foresters to help with the field inventory: Division of Forestry, Ohio Department of Natural Resources; Department of Forestry, Ohio Agricultural Experiment Station; Baker Wood Preserving Company, McArthur, Ohio; and the Wayne-Hoosier National Forest.

Field work in the Hill Country of Ohio was done during the period August 1952 to September 1953. From initial planning to final compilation, these people made contributions to the survey.

General Supervision -- R. K. Winters, R. N. Cunningham, J. T. Morgan

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Statistical Computations -- C. E. Jensen, L. F. Compton, M. K. Peirsol

Report -- O. K. Hutchison

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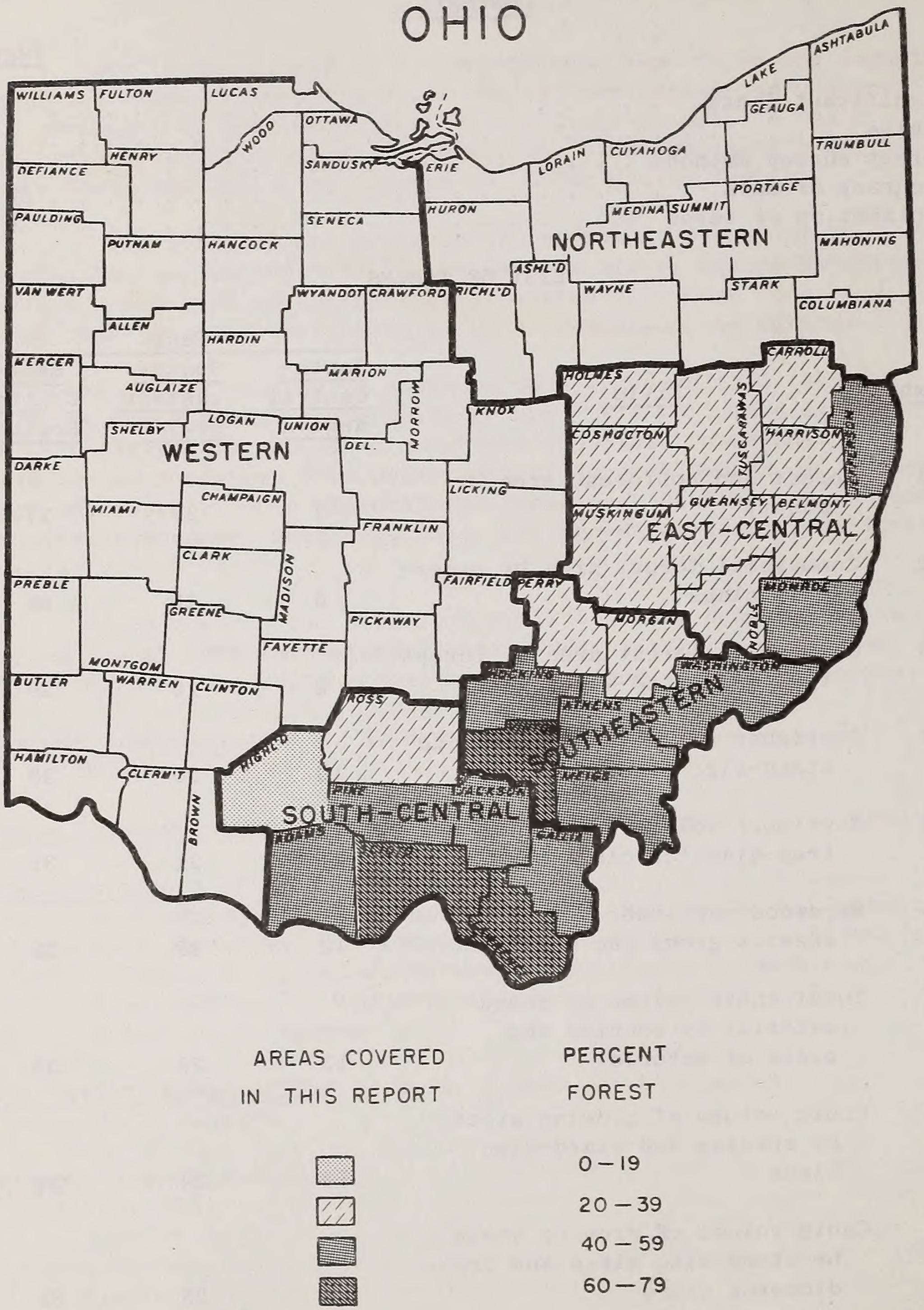
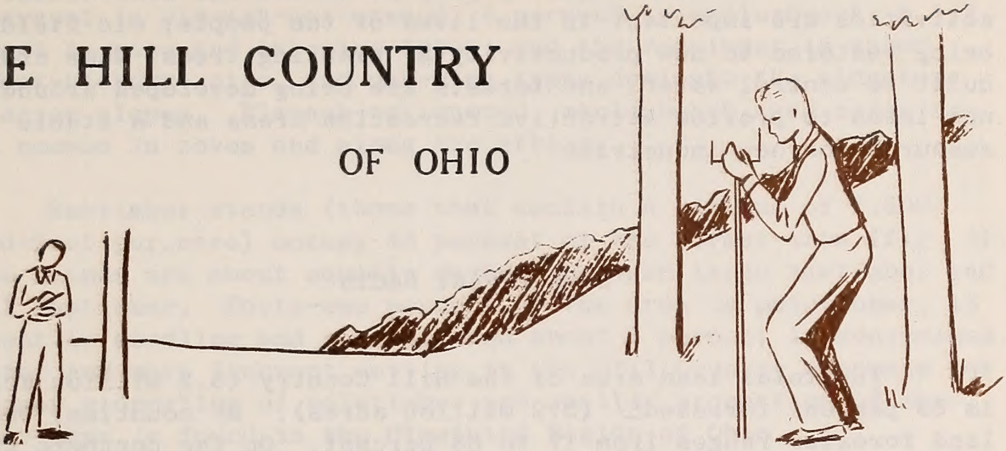


Frontispiece.--Forest Survey regions in Ohio.

FOREST STATISTICS FOR

THE HILL COUNTRY

OF OHIO



In this report forest-area and timber-volume statistics for South-Central, Southeastern, and East-Central Ohio (frontispiece) are shown separately. Regional boundaries were established for the purpose of grouping counties with similar forest, soil, geologic, or economic conditions. This report covers the unglaciated, hill region of the State.

The Hill Country of Ohio is probably best known for its mineral deposits, ceramic industries, old iron furnaces, Indian mounds, many recreation areas, and recently for its rapid industrial expansion. The Hill Country contains part of the Wayne-Hoosier National Forest, the Shawnee, Zaleski, Tar Hollow, and several smaller State forests, and most of the Muskingum Conservancy District. Several private corporations also are managing large tracts of forest land.

The residual soils of this region (derived mostly from sandstone and shale) are cultivated wherever the land is level enough. Farming is mostly restricted to the flat ridgetops and valley floors where of course the best soils are found.

Underlying both farmed and timbered areas are rich deposits of coal, clay, some oil and gas, limestone, and sandstone. Coal and clay are the most important. Ohio is well known for its pottery, brick, tile, and other clay products. Much of the coal is in beds that can be strip-mined. Iron ore, associated with the coal strata, was mined during the 19th century but now only a few relic furnaces remain as reminders of this early industry. The furnaces were heated with charcoal made from timber cut in the surrounding forests. On the areas cut for charcoal the stands are now even-aged and of sprout origin.

Although agriculture and mineral industries are most important to this region, the forests contribute in many ways and are becoming increasingly more important. Many sawmills operate in the hill region and many farmers increase their income by producing fence posts, mine props, and pulpwood.

Because of the rough topography, forest and soil conservation activities are important in the lives of the people; old fields are being restored to new productivity by planting trees, dams are being built to control water, and forests are being developed around the new lakes to provide attractive recreation areas and a stable resource for new industries.

SIGNIFICANT FACTS

The total land area of the Hill Country (8.2 million acres) is 39 percent forested[1] (3.2 million acres). By counties, the land forested ranges from 17 to 68 percent. On the northern and western fringe areas of the hills, the forests occur as scattered farm woodlands, but interior sections have large continuous forests broken only by small cultivated fields.

Ninety-one percent (fig. 1) of the forest land is privately owned: 50 percent by industrial and other non-farm, private owners and 41 percent by farmers. Industrial owners include coal and lumber companies, and electric power and gas companies. All of the forest land will grow merchantable timber, but 13,000 acres are reserved from commercial use. The reserved forests are chiefly in parks and monuments.

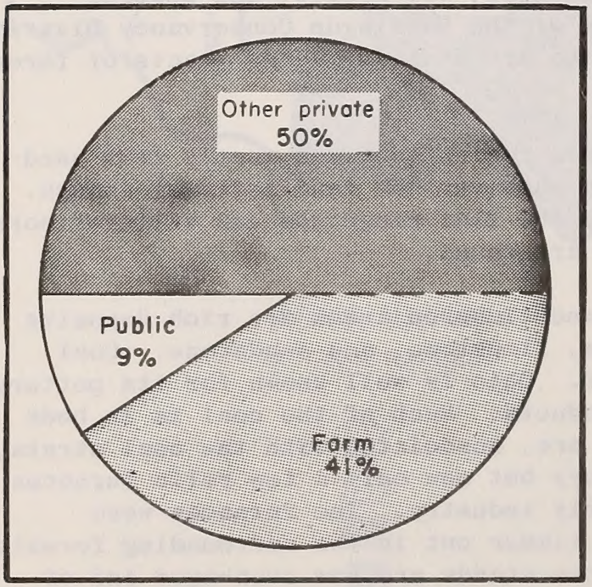


Figure 1.--
Forest land ownership.

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[1] For definition of forest land see page 39.

Seventy-one percent of the forest is in the oak-hickory type; 13 percent is elm-ash-cottonwood; 8 percent is maple-beech; 6 1/2 percent is pine and oak-pine types; and the remainder is aspen. The oak-hickory, pine, and oak-pine types dominate the ridgetops and drier slopes. Elm-ash-cottonwood, maple-beech, and aspen are most common in coves and along the streams.

Sawtimber stands (those that contain a minimum of 1,500 board-feet per acre) occupy 45 percent of the forest area (fig. 2); these stands are about equally divided between large sawtimber and small sawtimber. Forty-one percent of the area is poletimber, 13 percent is seedling and sapling, and about 1 percent is nonstocked. Heavier and more frequent cutting in the Hill Country accounts for a larger proportion of poletimber and smaller proportion of sawtimber than is found in the Glaciated Region of Ohio.

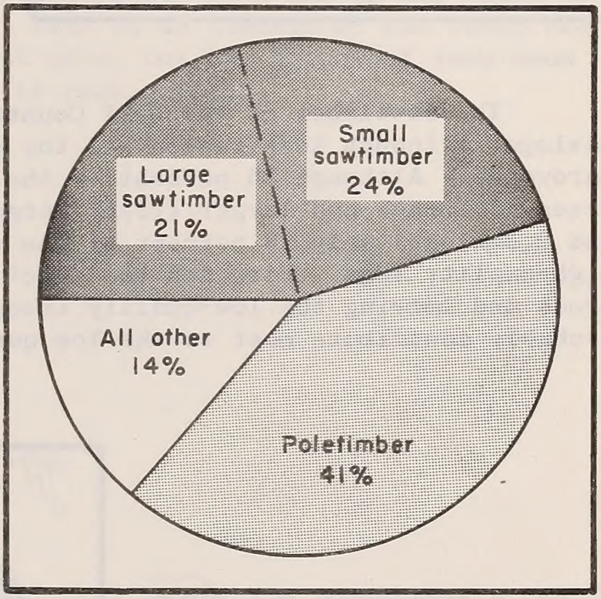


Figure 2.--Forest area by stand-size class.

Sawtimber volume in the Hill Country amounts to 7 1/4 billion board-feet of which 85 percent is in sawtimber stands (fig. 3). Only 15 percent is scattered in stands having less than 1,500 board-feet per acre. In the East-Central Region, 68 percent of the sawtimber volume is in large sawtimber stands, but in the South-Central Region only 33 percent of the sawtimber volume is in large sawtimber stands.

In the Hill Country the sawtimber volume is distributed more evenly among many species than in the Glaciated Region. Various species of oak make up 49 percent of the sawtimber volume; 9 percent is yellow-poplar; 8 percent is hickory; and ash, elm, beech, maple, black walnut, and other species make up lesser amounts.

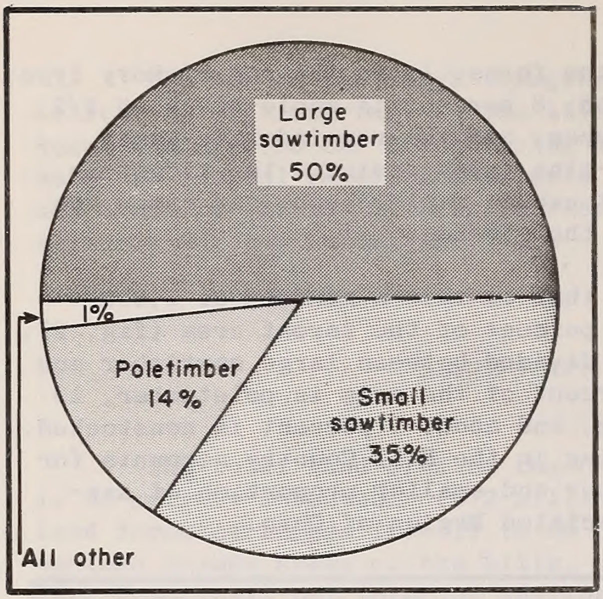
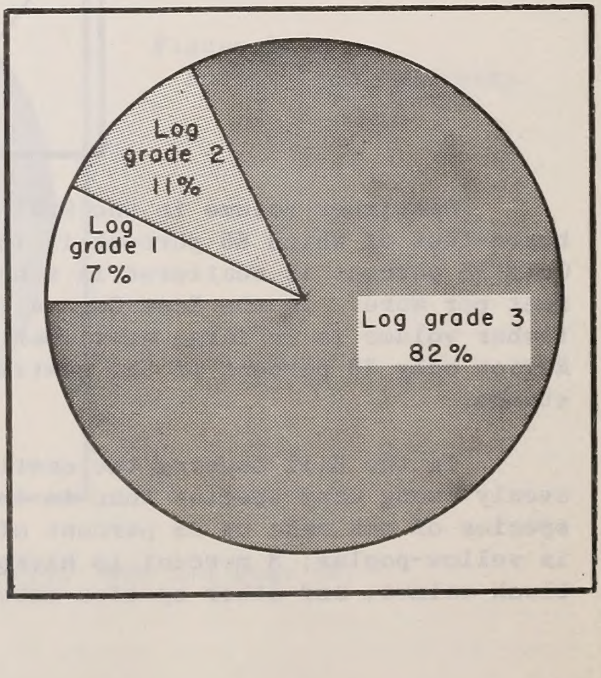


Figure 3.--Sawtimber volume by stand-size class.

The sawtimber of the Hill Country is mostly in low-quality sawlogs, although this region has the potential to grow fine hardwoods. Although 55 percent of the board-foot volume is in trees 15 inches and larger (trees large enough to contain grade 1 and 2 sawlogs) only 18 percent of the volume (fig. 4) is in these high-quality logs. Fire and the practice of cutting only the best trees and leaving the low-quality trees to produce the next crop probably contribute most to the low quality of the stands.

Figure 4.--Hardwood sawtimber volume by log grade.



Sawtimber stands average 4,287 board-feet per acre. Those that qualify as large sawtimber stands average 5,418 board-feet per acre. The average volume could be increased. But even more important, the timber volume and species composition of the stands could be greatly improved. To speed this improvement and increase forest values in the Hill Country, Federal, State, and private organizations are cooperating in research and education.

The total growing-stock volume in the Hill Country is 2.2 billion cubic feet, an average volume of 674 cubic feet per acre. Sixty percent of the growing-stock volume is in sawtimber trees and 40 percent is in poletimber trees. The growing-stock volume is much less than the area will support.

In addition to the growing stock, the Hill Country has 712 million cubic feet of sound wood in cull trees and in the limbs of merchantable sawtimber trees. This is an average of 222 cubic feet or about 3 1/2 cords per forest acre, but the amount of such wood available in sawtimber stands is much greater.

Table 1.--Forest and nonforest area by county, 1952

County	Total land area[1]	Forest area		Nonforest area	
	Thousand acres	Thousand acres	Percent	Thousand acres	Percent
Adams	376	188	50	188	50
Gallia	301	130	43	171	57
Highland	355	59	17	296	83
Jackson	269	124	46	145	54
Lawrence	292	184	63	108	37
Pike	283	161	57	122	43
Ross	440	165	38	275	62
Scioto	390	237	61	153	39
All counties	2,706	1,248	46	1,458	54

[1] Source: Area of the U. S. 1950. U. S. Bureau of the Census.

Table 2.--Commercial forest area by ownership class, 1952

Ownership class	Commercial forest area[1]	
	Thousand acres	Percent
Public:		
National Forest	43	3.4
Other federal	([2])	--
State	104	8.4
Total public	[3]147	11.8
Private:		
Farm	535	43.1
Industrial and other	561	45.1
Total private	1,096	88.2
All ownerships	1,243	100.0

---

[1] Does not include 1,000 acres of forest land in federal ownership and 4,000 acres in state ownership which are reserved from commercial timber use.

[2] Less than 500 acres.

[3] Includes less than 500 acres in county and municipal ownership.

Table 3.--Commercial forest area by forest type and stand-size class, 1952

(In thousands of acres)

Forest type	Total		Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Seedling & sapling stands[1]
		Percent				
White-red-jack pine	4	0.3	--	--	4	--
Shortleaf pine	60	4.8	--	21	16	23
Oak-pine	71	5.7	--	15	39	17
Oak-hickory	934	75.2	135	329	379	91
Elm-ash-cottonwood	128	10.3	16	19	71	22
Maple-beech	46	3.7	15	18	13	--
All types	1,243	100.0	166	402	522	153
Percent	100.0		13.4	32.3	42.0	12.3

[1] Includes the volume on nonstocked and other areas.

Table 4.--Sawtimber volume on commercial forest area by species and stand-size class, 1952

(In million board-feet)

Species	Total	Percent	Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Seedling & sapling stands 1/
Pine	162	6.4	3	111	46	2
Other softwoods	5	.2	--	2	2	1
White oak	435	17.1	129	247	49	10
Chestnut oak	330	13.0	91	216	23	--
Other white oaks	59	2.3	19	25	15	--
Black oak	325	12.8	120	184	21	(2/)
Northern red oak	137	5.4	69	52	13	3
Scarlet oak	184	7.2	23	117	42	2
Other red oaks	7	.3	2	2	3	--
Hickory	215	8.4	70	111	33	1
White ash	55	2.2	31	20	4	(2/)
Black ash	13	.5	5	5	3	--
American elm	17	.7	7	7	3	(2/)
Slippery elm	20	.8	8	10	2	--
Yellow-poplar	170	6.7	86	57	23	4
Sugar maple	89	3.5	24	51	14	--
Soft maple	87	3.4	51	29	7	--
Sycamore	27	1.1	10	4	13	(2/)
Beech	68	2.7	46	14	8	--
Black walnut	34	1.3	13	12	7	2
Post species	10	.4	1	6	3	--
Other hardwoods	92	3.6	37	36	19	--
All species	2,541	100.0	845	1,318	353	25
Percent	100.0		33.2	51.9	13.9	1.0

1/ Includes the volume on nonstocked and other areas.

2/ Less than 0.5 million board-feet.

Table 5.--Sawtimber volume on commercial forest area by species and tree-diameter class, 1952

(In million board-feet)

Species	Total	Tree-diameter class (inches)									
		10	12	14	16	18	20	22	24	26	28+
Pine	162	53	49	25	18	17	--	--	--	--	--
Other softwoods	5	1	(1/)	2	1	1	--	--	--	--	--
White oak	435	--	135	123	75	35	28	10	13	3	13
Chestnut oak	330	--	111	91	69	34	21	4	--	--	--
Other white oaks	59	--	14	16	8	7	2	--	1	4	7
Black oak	325	--	74	97	60	34	20	10	22	2	6
Northern red oak	137	--	25	26	18	20	13	12	11	5	7
Scarlet oak	184	--	50	65	41	13	3	3	6	3	--
Other red oaks	7	--	1	1	1	4	--	--	--	--	--
Hickory	215	-	87	54	35	20	6	13	--	--	--
White ash	55	--	16	15	7	1	9	--	--	7	--
Black ash	13	--	4	2	--	3	--	2	--	2	--
American elm	17	--	5	4	4	1	3	(1/)	--	--	--
Slippery elm	20	--	7	6	3	3	--	1	--	--	--
Yellow-poplar	170	--	37	35	39	27	12	9	5	6	--
Sugar maple	89	--	25	26	19	3	3	11	1	1	--
Soft maple	87	--	14	23	9	9	7	6	4	2	13
Sycamore	27	--	3	6	4	3	4	--	1	6	--
Beech	68	--	9	10	9	6	12	5	2	6	9
Black walnut	34	--	11	13	4	4	1	1	--	--	--
Post species	10	--	6	3	1	(1/)	--	--	--	--	--
Other hardwoods	92	--	28	28	10	7	6	9	2	--	2
All species	2,541	54	711	671	435	252	150	96	68	47	57
Percent	100.0	2.1	28.0	26.4	17.1	9.9	5.9	3.8	2.7	1.8	2.3

1/ Less than 0.5 million board-feet.

Table 6.--Hardwood sawtimber volume by species group and log grade, 1952

Species group	Volume	Log grade 1		Log grade 2		Log grade 3	
	Million board-feet	Million board-feet	Percent	Million board-feet	Percent	Million board-feet	Percent
White oaks[1]	824	36	4	97	12	691	84
Red oaks[2]	653	33	5	65	10	555	85
Hickory	215	6	3	26	12	183	85
Elms	37	4	11	4	11	29	78
Yellow-poplar	170	15	9	33	19	122	72
Sugar maple	89	3	3	--	--	86	97
Other hardwoods	386	45	12	72	18	269	70
All hardwoods	2,374	142	6	297	13	1,935	81

1/ Includes white oak, chestnut oak, and other white oaks.

2/ Includes black oak, northern red oak, and other red oaks.

Table 7.--Total cubic volume of sound material on commercial forest area by species and class of material, 1952

(In million cubic feet)

Species	Total sound material	Growing stock				Other material		
		Total	Sawtimber trees		Pole-timber	Total	Cull trees 1/	Hardwood limbs 2/
			Sawlog portion	Upper stem				
Pine	51.5	49.1	26.7	4.2	18.2	2.4	2.4	--
Other softwoods	3.0	2.9	1.0	.3	1.6	.1	.1	--
White oak	159.6	129.8	69.2	11.5	49.1	29.8	5.1	24.7
Chestnut oak	147.5	116.8	54.0	8.7	54.1	30.7	9.3	21.4
Other white oaks	21.8	17.0	9.3	2.0	5.7	4.8	1.8	3.0
Black oak	117.4	88.7	51.4	7.8	29.5	28.7	8.3	20.4
Northern red oak	44.3	32.1	21.0	2.8	8.3	12.2	3.6	8.6
Scarlet oak	74.3	48.5	29.5	4.2	14.8	25.8	11.4	14.4
Other red oaks	4.1	3.0	1.1	.1	1.8	1.1	.5	.6
Hickory	115.6	91.9	34.0	4.9	53.0	23.7	8.7	15.0
White ash	30.5	24.0	8.6	1.2	14.2	6.5	2.7	3.8
Black ash	5.2	3.6	2.0	.3	1.3	1.6	.8	.8
American elm	14.2	8.4	2.7	.6	5.1	5.8	4.2	1.6
Slippery elm	13.1	11.0	3.4	.6	7.0	2.1	.9	1.2
Yellow-poplar	65.2	51.8	26.5	3.1	22.2	13.4	2.6	10.8
Sugar maple	42.2	30.2	13.9	2.2	14.1	12.0	5.5	6.5
Soft maple	40.0	28.8	13.4	2.3	13.1	11.2	4.9	6.3
Sycamore	14.3	8.5	4.2	.6	3.7	5.8	3.4	2.4
Beech	31.6	16.3	10.2	1.5	4.6	15.3	9.3	6.0
Black walnut	15.7	12.3	5.5	1.0	5.8	3.4	1.4	2.0
Post species	29.1	17.1	1.6	.3	15.2	12.0	9.5	2.5
Other hardwoods	47.2	33.6	14.6	2.2	16.8	13.6	6.8	6.8
Noncommercial	2.7	--	--	--	--	2.7	2.6	.1
All species	1,090.1	825.4	403.8	62.4	359.2	264.7	105.8	158.9

1/ Sound bole volume only.

2/ Limbs of both merchantable and cull hardwood trees of sawtimber size to a 4-inch minimum diameter.

Table 8.--Cubic volume of growing stock on commercial forest area by species and stand-size class, 1952

(In million cubic feet)

Species	Total		Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Seedling & sapling stands 1/
		Percent				
Pine	49.1	5.9	0.7	27.7	20.2	0.5
Other softwoods	2.9	.3	.1	.5	(2/)	--
White oak	129.8	15.7	26.4	73.9	26.9	2.6
Chestnut oak	116.8	14.2	21.3	72.2	23.3	--
Other white oaks	17.0	2.1	4.2	7.6	5.2	--
Black oak	88.7	10.7	23.2	47.4	17.3	.8
Northern red oak	32.1	3.9	12.4	13.3	5.9	.5
Scarlet oak	48.5	5.9	5.5	30.0	12.7	.3
Other red oaks	3.0	.4	.5	.6	1.9	(2/)
Hickory	91.9	11.1	20.6	45.0	25.2	1.1
White ash	24.0	2.9	7.3	8.5	7.4	.8
Black ash	3.6	.4	1.0	1.7	.9	(2/)
American elm	8.4	1.0	1.8	2.4	4.0	.2
Slippery elm	11.0	1.3	3.2	3.9	3.9	--
Yellow-poplar	51.8	6.3	16.7	16.8	16.9	1.4
Sugar maple	30.2	3.7	7.2	16.7	6.0	.3
Soft maple	28.8	3.5	11.2	12.5	5.0	.1
Sycamore	8.5	1.0	1.7	.9	5.4	.5
Beech	16.3	2.0	9.1	3.8	3.4	--
Black walnut	12.3	1.5	3.0	3.7	5.0	.6
Post species	17.1	2.1	2.2	5.2	9.5	.2
Other hardwoods	33.6	4.1	10.1	11.5	11.8	.2
All species	825.4	100.0	189.4	405.8	219.7	10.5
Percent	100.0		22.9	49.2	26.6	1.3

1/ Includes the volume on nonstocked and other areas.

2/ Less than 0.05 million cubic feet or 0.05 percent.

Table 9.--Cubic volume of growing stock on commercial forest area by stand-size class and tree-diameter class, 1952

(In million cubic feet)

Tree-diameter class (inches)	Stand-size class				All classes	Percent
	Large sawtimber	Small sawtimber	Poletimber	Seedling & sapling[1]		
6	8.4	25.2	42.7	1.8	78.1	9.4
8	13.2	54.8	55.9	2.0	125.9	15.2
10	19.7	86.4	58.5	1.9	166.5	20.2
12	17.6	95.2	24.6	2.1	139.5	16.9
14	25.8	80.2	16.3	1.3	123.6	15.0
16	28.4	37.0	11.7	.3	77.4	9.4
18	22.4	15.5	5.6	.2	43.7	5.3
20	16.7	6.4	2.3	.2	25.6	3.1
22	12.2	2.6	1.3	.1	16.2	1.9
24	8.9	2.2	.4	--	11.5	1.4
26	6.8	.3	.4	.5	8.0	1.0
28+	9.3	--	--	.1	9.4	1.2
Total	189.4	405.8	219.7	10.5	825.4	100.0

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[1] Includes volume on nonstocked and other areas.

Table 10.--Average volume per acre by stand-size class, 1952

Stand-size class	Average volume per acre	
	Board-feet	Cubic feet[1]
Large sawtimber stands	5,090	1,141.0
Small sawtimber stands	3,279	1,009.5
Poletimber stands	676	420.9
Seedling and sapling stands[2]	163	68.6
All classes	2,044	664.0

[1] Growing stock only.
[2] Includes the volume on nonstocked and other areas.

Table 1.--Forest and nonforest area by county, 1952

County	Total land area[1]	Forest area		Nonforest area	
	Thousand acres	Thousand acres	Percent	Thousand acres	Percent
Athens	323	138	43	185	57
Hocking	269	151	56	118	44
Meigs	278	132	47	146	53
Morgan	267	93	35	174	65
Perry	262	87	33	175	67
Vinton	263	179	68	84	32
Washington	408	192	47	216	53
All counties	2,070	972	47	1,098	53

[1] Source: Area of the U. S. 1950. U. S. Bureau of the Census.

Table 2.--Commercial forest area by ownership class, 1952

Ownership class	Commercial forest area	
	Thousand acres	Percent
Public:		
National Forest	42	4.4
State	41	4.2
Total public	[1]83	8.6
Private:		
Farm	343	35.5
Industrial and other	539	55.9
Total private	882	91.4
All ownerships	965	100.0

[1] Includes less than 500 acres in county and municipal ownership.

Table 3.--Commercial forest area by forest type and stand-size class, 1952

(In thousands of acres)

Forest type	Total		Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Seedling & sapling stands[1]
		Percent				
White-red-jack pine	4	0.4	--	4	--	--
Shortleaf pine	42	4.3	--	2	28	12
Oak-pine	16	1.7	--	4	--	12
Oak-hickory	731	75.8	144	216	287	84
Elm-ash-cottonwood	92	9.5	24	12	22	34
Maple-beech	72	7.5	32	2	28	10
Aspen	8	.8	--	--	8	--
All types	965	100.0	200	240	373	152
Percent	100.0		20.7	24.9	38.7	15.7

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[1] Includes volume on nonstocked and other areas.

Table 4.--Sawtimber volume on commercial forest area by species and stand-size class, 1952

(In million board-feet)

Species	Total		Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Seedling & sapling stands[1]
		Percent				
Pine	55	2.4	3	35	15	2
Other softwoods	21	.9	4	17	--	--
White oak	348	15.1	150	153	37	8
Chestnut oak	169	7.4	61	99	7	2
Other white oaks	5	.2	3	1	1	--
Black oak	247	10.7	135	90	21	1
Northern red oak	171	7.4	95	45	31	--
Scarlet oak	185	8.0	65	104	15	1
Other red oaks	3	.1	1	1	([2])	1
Hickory	199	8.7	90	78	31	--
White ash	[3]54	2.3	25	17	11	1
American elm	59	2.6	30	17	12	--
Slippery elm	31	1.4	16	9	6	--
Cottonwood	6	.3	--	6	--	--
Yellow-poplar	235	10.2	116	55	64	--
Sugar maple	67	2.9	40	12	14	1
Soft maple	51	2.2	31	15	4	1
Sycamore	52	2.3	39	5	8	([2])
Beech	150	6.5	121	7	22	--
Black walnut	54	2.4	21	19	13	1
Post species	14	.6	3	5	6	--
Other hardwoods	125	5.4	78	35	11	1
All species	2,301	100.0	1,127	825	329	20
Percent	100.0		49.0	35.9	14.3	.8

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[1] Includes the volume on nonstocked and other areas.

[2] Less than 0.5 million board-feet.

[3] Includes 1 million board-feet of black ash.

Table 5.--Sawtimber volume on commercial forest area by species and tree-diameter class, 1952

(In million board-feet)

Species	Total	Tree-diameter class (inches)									
		10	12	14	16	18	20	22	24	26	28+
Pine	55	25	17	11	(1/)	2	--	--	--	--	--
Other softwoods	21	5	4	6	4	--	2	--	--	--	--
White oak	348	--	91	76	76	25	27	10	9	13	21
Chestnut oak	169	--	58	44	34	16	12	1	2	1	1
Other white oaks	5	--	1	2	1	(1/)	1	--	--	--	--
Black oak	247	--	43	50	39	43	26	20	7	10	9
Northern red oak	171	--	21	21	31	16	25	16	7	15	19
Scarlet oak	185	--	39	43	35	29	17	11	7	3	1
Other red oaks	3	--	(1/)	(1/)	--	1	--	2	--	--	--
Hickory	199	--	58	52	35	25	13	10	1	4	1
White ash	2/ 54	--	20	12	5	8	6	3	--	--	--
American elm	59	--	11	10	9	7	6	6	7	3	--
Slippery elm	31	--	9	12	2	1	2	--	--	--	5
Cottonwood	6	--	(1/)	--	--	--	3	3	--	--	--
Yellow-poplar	235	--	58	70	53	16	18	2	8	5	5
Sugar maple	67	--	17	11	17	11	4	1	2	2	2
Soft maple	51	--	14	11	9	9	6	2	--	--	--
Sycamore	52	--	8	6	5	2	14	1	1	3	12
Beech	150	--	13	16	27	22	14	18	4	17	19
Black walnut	54	--	16	14	13	4	3	3	1	--	--
Post species	14	--	6	2	5	1	--	--	--	--	--
Other hardwoods	125	--	25	30	18	19	8	4	9	4	8
All species	2,301	30	529	499	418	257	207	113	65	80	103
Percent	100.0	1.3	23.0	21.7	18.2	11.2	9.0	4.9	2.8	3.5	4.4

1/ Less than 0.5 million board-feet.

2/ Includes 1 million board-feet of black ash.

Table 6.--Hardwood sawtimber volume by species group and log grade, 1952

Species group	Volume	Log grade 1		Log grade 2		Log grade 3	
	Million board-feet	Million board-feet	Percent	Million board-feet	Percent	Million board-feet	Percent
White oaks[1]	522	53	10	76	15	393	75
Red oaks[2]	606	26	4	59	10	521	86
Hickory	199	7	3	27	14	165	83
Elms	90	7	8	6	7	77	85
Yellow-poplar	235	29	12	20	9	186	79
Sugar maple	67	2	3	3	4	62	93
Other hardwoods	506	43	9	53	10	410	81
All hardwoods	2,225	167	7	244	11	1,814	82

[1] Includes white oak, chestnut oak, and other white oaks.
[2] Includes black oak, northern red oak, and other red oaks.

Table 7.--Total cubic volume of sound material on commercial forest area by species and class of material, 1952

(In million cubic feet)

Species	Total sound material	Growing stock				Other material		
		Total	Sawtimber trees		Pole-timber	Total	Cull trees [1]	Hardwood limbs [2]
			Sawlog portion	Upper stem				
Pine	17.2	17.0	9.3	1.5	6.2	0.2	0.2	--
Other softwoods	5.0	4.9	3.6	.4	.9	.1	.1	--
White oak	124.8	100.0	54.6	8.8	36.6	24.8	4.8	20.0
Chestnut oak	72.1	57.8	27.6	4.4	25.8	14.3	3.2	11.1
Other white oaks	2.8	2.3	.7	.2	1.4	.5	.2	.3
Black oak	75.4	59.6	38.3	5.9	15.4	15.8	1.7	14.1
Northern red oak	49.8	39.1	25.8	3.6	9.7	10.7	1.0	9.7
Scarlet oak	58.5	44.6	29.3	4.1	11.2	13.9	2.3	11.6
Other red oaks	1.1	.9	.6	.1	.2	.2	--	.2
Hickory	88.1	72.6	31.3	4.1	37.2	15.5	2.8	12.7
White ash	[3]24.5	18.9	8.5	1.2	9.2	5.6	2.0	3.6
American elm	26.2	19.0	9.3	1.9	7.8	7.2	3.8	3.4
Slippery elm	18.6	14.8	5.0	.9	8.9	3.8	1.7	2.1
Cottonwood	1.3	1.0	.9	.1	--	.3	--	.3
Yellow-poplar	76.2	60.5	37.0	4.4	19.1	15.7	1.3	14.4
Sugar maple	28.1	19.8	10.3	1.7	7.8	8.3	3.6	4.7
Soft maple	28.3	19.5	8.1	1.3	10.1	8.8	4.5	4.3
Sycamore	15.5	11.7	8.1	1.0	2.6	3.8	.7	3.1
Beech	62.0	31.1	22.4	3.0	5.7	30.9	16.4	14.5
Black walnut	21.9	18.1	8.7	1.5	7.9	3.8	.7	3.1
Post species	17.2	13.1	2.3	.5	10.3	4.1	2.4	1.7
Other hardwoods	54.3	41.3	19.8	2.8	18.7	13.0	4.3	8.7
Noncommercial	8.9	--	--	--	--	8.9	8.9	([4])
All species	877.8	667.6	361.5	53.4	252.7	210.2	66.6	143.6

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[1] Sound bole volume only.

[2] Limbs, of both merchantable and cull hardwood trees of sawtimber size, to a 4-inch minimum diameter.

[3] Includes 0.4 million cubic feet of black ash.

[4] Less than 0.05 million cubic feet or 0.05 percent.

Table 8.--Cubic volume of growing stock on commercial forest area by species and stand-size class, 1952

(In million cubic feet)

Species	Total		Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Seedling & sapling stands[1]
		Percent				
Pine	17.0	2.5	.9	9.5	5.6	1.0
Other softwoods	4.9	.7	.7	4.0	.2	--
White oak	100.0	15.0	32.9	45.6	20.1	1.4
Chestnut oak	57.8	8.7	16.8	34.7	5.9	.4
Other white oaks	2.3	.3	1.0	.5	.8	--
Black oak	59.6	8.9	26.6	22.7	9.2	1.1
Northern red oak	39.1	5.9	18.0	10.4	10.7	([2])
Scarlet oak	44.6	6.7	12.3	25.0	7.0	.3
Other red oaks	.9	.1	.3	.3	.1	.2
Hickory	72.6	10.9	22.4	27.5	22.2	.5
White ash	[3]18.9	2.8	6.4	7.7	4.0	.8
American elm	19.0	2.8	7.5	4.4	7.0	.1
Slippery elm	14.8	2.2	5.4	4.1	5.3	([2])
Cottonwood	1.0	.1	--	1.0	--	--
Yellow-poplar	60.5	9.1	23.6	15.8	20.2	.9
Sugar maple	19.8	3.0	10.9	4.7	3.9	.3
Soft maple	19.5	2.9	8.3	7.0	4.0	.2
Sycamore	11.7	1.8	6.9	1.0	3.7	.1
Beech	31.1	4.7	23.5	2.8	4.8	--
Black walnut	18.1	2.7	5.3	6.7	5.7	.4
Post species	13.1	2.0	2.7	2.7	6.7	1.0
Other hardwoods	41.3	6.2	18.7	10.1	11.3	1.2
All species	667.6	100.0	251.1	248.2	158.4	9.9
Percent	100.0		37.6	37.2	23.7	1.5

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[1] Includes the volume on nonstocked and other areas.

[2] Less than 0.05 million cubic feet or 0.05 percent.

[3] Includes 0.3 million cubic feet of black ash.

Table 9.--Cubic volume of growing stock on commercial forest area by stand-size class and tree-diameter class, 1952

(In million cubic feet)

Tree-diameter class (inches)	Stand-size class				All classes	Percent
	Large sawtimber	Small sawtimber	Poletimber	Seedling & sapling[1]		
6	8.7	16.1	25.4	2.4	52.6	7.9
8	17.8	33.3	34.8	1.5	87.4	13.1
10	28.2	49.7	38.9	2.3	119.1	17.8
12	25.5	55.1	21.0	1.8	103.4	15.5
14	31.6	45.9	13.4	.6	91.5	13.7
16	33.9	26.7	12.8	.5	73.9	11.1
18	29.8	10.1	4.1	.1	44.1	6.6
20	26.1	5.9	2.7	.5	35.2	5.3
22	12.7	4.0	2.2	.2	19.1	2.8
24	8.6	1.4	1.1	--	11.1	1.7
26	12.0	--	1.4	--	13.4	2.0
28+	16.2	--	.6	--	16.8	2.5
Total	251.1	248.2	158.4	9.9	667.6	100.0

[1] Includes the volume on nonstocked and other areas.

Table 10.--Average volume per acre by stand-size class, 1952

Stand-size class	Average volume per acre	
	Board-feet	Cubic feet[1]
Large sawtimber stands	5,635	1,255.5
Small sawtimber stands	3,438	1,034.2
Poletimber stands	882	424.7
Seedling and sapling stands[2]	132	65.1
All classes	2,384	691.8

[1] Growing stock only.

[2] Includes the volume on nonstocked areas.

Table 1.--Forest and nonforest area by county, 1952

County	Total land area[1]	Forest area		Nonforest area	
	Thousand acres	Thousand acres	Percent	Thousand acres	Percent
Belmont	343	102	30	241	70
Carroll	248	60	24	188	76
Coshocton	349	102	29	247	71
Guernsey	332	87	26	245	74
Harrison	258	74	29	184	71
Holmes	271	54	20	217	80
Jefferson	263	107	41	156	59
Monroe	291	128	44	163	56
Muskingum	424	128	30	296	70
Noble	255	53	21	202	79
Tuscarawas	353	101	29	252	71
All counties	3,387	996	29	2,391	71

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[1] Source: Area of the United States, 1950. U. S. Bureau of the Census.

Table 2.--Commercial forest area by ownership class, 1952

Ownership class	Commercial forest area	
	Thousand acres	Percent
Public:		
National Forest	3	0.3
State	6	0.6
County and municipal	25	2.5
Total public	34	3.4
Private:		
Farm	446	44.8
Industrial and other	515	51.8
Total private	961	96.6
All ownerships	995	100.0

Table 3.--Commercial forest area by forest type and stand-size class, 1952

(In thousands of acres)

Forest type	Total		Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Seedling & sapling stands[1]
		Percent				
Shortleaf pine	6	0.6	--	--	--	6
Oak-pine	6	.6	--	--	--	6
Oak-hickory	628	63.1	155	80	278	115
Elm-ash-cottonwood	210	21.1	68	29	96	17
Maple-beech	145	14.6	76	28	27	14
All types	995	100.0	299	137	401	158
Percent	100.0		30.0	13.8	40.3	15.9

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[1] Includes the volume on nonstocked and other areas.

Table 4.--Sawtimber volume on commercial forest area by species and stand-size class, 1952

(In million board-feet)

Species	Total		Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Seedling & sapling stands[1]
		Percent				
Softwoods	37	1.5	37	--	--	--
White oak	344	14.2	242	61	35	6
Chestnut oak	52	2.1	47	3	2	--
Black oak	190	7.9	144	27	19	--
Northern red oak	259	10.7	209	31	17	2
Scarlet oak	75	3.1	47	15	13	--
Other red oaks	4	.2	2	([2])	2	--
Hickory	165	6.8	95	50	17	3
White ash	99	4.1	65	15	19	--
American elm	123	5.1	72	28	23	--
Slippery elm	110	4.5	75	24	10	1
Cottonwood	4	.2	4	--	--	--
Yellow-poplar	239	9.9	165	35	38	1
Sugar maple	74	3.1	52	11	10	1
Soft maple	96	4.0	50	33	9	4
Sycamore	29	1.2	28	1	([2])	--
Beech	154	6.4	138	12	2	2
Black walnut	57	2.4	18	18	21	--
Post species	19	.8	4	5	8	2
Other hardwoods	284	11.8	137	75	66	6
All species	2,414	100.0	1,631	444	311	28
Percent	100.0		67.6	18.4	12.9	1.1

[1] Includes the volume on nonstocked and other areas.

[2] Less than 0.5 million board-feet.

Table 5.--Sawtimber volume on commercial forest area by species and tree-diameter class, 1952

(In million board-feet)

Species	Total	Tree-diameter class (inches)									
		10	12	14	16	18	20	22	24	26	28+
Softwoods	37	1	4	3	4	3	4	11	7	--	--
White oak	344	--	63	38	34	25	23	20	14	28	99
Chestnut oak	52	--	10	7	8	8	6	--	--	13	--
Black oak	190	--	22	20	32	30	30	11	20	11	14
Northern red oak	259	--	17	22	37	31	41	28	10	26	47
Scarlet oak	75	--	13	16	--	13	4	19	--	10	--
Other red oaks	4	--	2	--	--	2	--	--	--	--	--
Hickory	165	--	53	46	26	14	17	9	--	--	--
White ash	99	--	19	22	16	24	14	--	--	1	3
American elm	123	--	30	13	32	21	6	10	2	--	9
Slippery elm	110	--	32	30	20	12	12	--	2	--	2
Cottonwood	4	--	--	--	--	--	--	4	--	--	--
Yellow-poplar	239	--	27	37	51	16	22	15	21	7	37
Sugar maple	74	--	23	20	16	2	3	3	1	6	--
Soft maple	96	--	24	18	13	9	9	6	13	4	--
Sycamore	29	--	4	--	--	--	--	--	--	--	25
Beech	154	--	16	21	23	39	23	9	20	3	--
Black walnut	57	--	16	26	6	4	1	4	--	--	--
Post species	19	--	8	6	5	--	--	--	--	--	--
Other hardwoods	284	--	81	75	56	41	18	4	--	--	9
All species	2,414	1	464	420	385	294	233	153	110	109	245
Percent	100.0	(1/)	19.2	17.4	16.0	12.2	9.7	6.3	4.6	4.5	10.1

1/ Less than 0.05 percent.

Table 6.--Hardwood sawtimber volume by species group and log grade, 1952

Species group	Volume	Log grade 1		Log grade 2		Log grade 3	
	Million board-feet	Million board-feet	Percent	Million board-feet	Percent	Million board-feet	Percent
White oaks[1]	396	60	15	22	6	314	79
Red oaks[2]	528	44	8	53	10	431	82
Hickory	165	18	11	18	11	129	78
Elms	233	13	6	24	10	196	84
Yellow-poplar	239	24	10	39	16	176	74
Sugar maple	74	--	--	3	4	71	96
Other hardwoods	742	48	6	43	6	651	88
All hardwoods	2,377	207	9	202	8	1,968	83

[1] Includes white oak, chestnut oak, and other white oaks.

[2] Includes black oak, northern red oak, and other red oaks.

Table 7.--Total cubic volume of sound material on commercial forest area by species and class of material, 1952

(In million cubic feet)

Species	Total sound material	Growing stock				Other material		
			Sawtimber trees		Pole-timber		Cull trees [1]	Hardwood limbs [2]
		Total	Sawlog portion	Upper stem		Total		
Softwoods	6.7	6.6	5.8	0.5	0.3	0.1	0.1	--
White oak	101.9	79.7	52.3	7.9	19.5	22.2	2.9	19.3
Chestnut oak	18.9	15.4	8.1	1.6	5.7	3.5	.9	2.6
Other white oaks	.5	.2	--	--	.2	.3	.2	.1
Black oak	58.4	45.8	29.8	4.8	11.2	12.6	1.8	10.8
Northern red oak	66.0	50.2	39.3	5.4	5.5	15.8	1.0	14.8
Scarlet oak	21.0	15.7	11.4	1.8	2.5	5.3	1.0	4.3
Other red oaks	2.1	1.6	.8	.1	.7	.5	.2	.3
Hickory	62.8	51.4	26.2	3.5	21.7	11.4	1.5	9.9
White ash	[3]41.9	34.7	15.6	2.4	16.7	7.2	1.4	5.8
American elm	50.3	33.9	19.5	4.0	10.4	16.4	8.0	8.4
Slippery elm	41.8	32.3	17.6	2.9	11.8	9.5	2.4	7.1
Cottonwood	.9	.7	.6	.1	--	.2	--	.2
Yellow-poplar	71.2	55.0	36.2	3.8	15.0	16.2	1.5	14.7
Sugar maple	36.3	25.8	11.7	2.1	12.0	10.5	5.0	5.5
Soft maple	51.5	36.9	15.1	2.8	19.0	14.6	7.5	7.1
Sycamore	7.5	5.6	4.2	.5	.9	1.9	.1	1.8
Beech	67.2	34.6	22.9	4.0	7.7	32.6	17.2	15.4
Black walnut	22.6	18.1	9.3	1.7	7.1	4.5	1.4	3.1
Post species	28.5	15.7	3.5	.8	11.4	12.8	8.1	4.7
Other hardwoods	135.0	106.0	45.4	7.1	53.5	29.0	10.2	18.8
Noncommercial	9.7	--	--	--	--	9.7	9.0	.7
All species	902.7	665.9	375.3	57.8	232.8	236.8	81.4	155.4

[1] Sound bole volume only.

[2] Limbs, of both merchantable and cull hardwood trees of sawtimber size, to a 4-inch minimum diameter.

[3] Includes 0.7 million cubic feet of black ash.

Table 8.--Cubic volume of growing stock on commercial forest area by species and stand-size class, 1952

(In million cubic feet)

Species	Total		Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Seedling & sapling stands[1]
		Percent				
Softwoods	6.6	1.0	6.3	--	--	0.3
White oak	79.7	12.0	45.9	16.1	16.6	1.1
Chestnut oak	15.4	2.3	11.3	.6	3.5	--
Other white oaks	.2	([2])	.1	--	.1	--
Black oak	45.8	6.9	27.3	6.0	12.5	--
Northern red oak	50.2	7.5	37.8	6.0	6.1	.3
Scarlet oak	15.7	2.4	9.2	3.6	2.9	--
Other red oaks	1.6	.2	.3	.1	.5	.7
Hickory	51.4	7.7	22.9	16.0	11.8	.7
White ash	[3]34.7	5.2	18.9	5.0	10.8	--
American elm	33.9	5.1	16.1	8.2	9.6	--
Slippery elm	32.3	4.9	17.2	7.2	7.4	.5
Cottonwood	.7	.1	.7	--	--	--
Yellow-poplar	55.0	8.3	28.8	8.2	17.2	.8
Sugar maple	25.8	3.9	15.7	5.5	4.3	.3
Soft maple	36.9	5.5	14.6	12.7	8.9	.7
Sycamore	5.6	.8	4.6	.3	.7	--
Beech	34.6	5.2	28.5	3.3	2.1	.7
Black walnut	18.1	2.7	5.2	5.2	7.7	--
Post species	15.7	2.4	2.6	4.1	7.6	1.4
Other hardwoods	106.0	15.9	38.0	27.3	39.0	1.7
All species	665.9	100.0	352.0	135.4	169.3	9.2
Percent	100.0		52.9	20.3	25.4	1.4

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[1] Includes the volume on nonstocked and other areas.

[2] Less than 0.05 percent.

[3] Includes 0.7 million cubic feet of black ash.

Table 9.--Cubic volume of growing stock on commercial forest area by stand-size class and tree-diameter class, 1952

(In million cubic feet)

Tree-diameter class (inches)	Stand-size class				All classes	Percent
	Large sawtimber	Small sawtimber	Poletimber	Seedling & sapling[1]		
6	10.9	7.5	30.7	1.6	50.7	7.6
8	23.1	18.5	42.7	.8	85.1	12.8
10	31.8	26.2	37.7	1.4	97.1	14.6
12	34.2	34.4	21.2	1.9	91.7	13.8
14	35.0	26.7	15.4	.9	78.0	11.7
16	45.4	11.3	11.7	.9	69.3	10.4
18	42.4	4.8	4.0	.4	51.6	7.7
20	34.5	2.6	2.3	.5	39.9	6.0
22	20.5	2.6	2.8	--	25.9	3.9
24	16.5	.8	.2	.8	18.3	2.7
26	17.9	--	.6	--	18.5	2.8
28+	39.8	--	--	--	39.8	6.0
Total	352.0	135.4	169.3	9.2	665.9	100.0

[1] Includes the volume on nonstocked and other areas.

Table 10.--Average volume per acre by stand-size class, 1952

Stand-size class	Average volume per acre	
	Board-feet	Cubic feet[1]
Large sawtimber stands	5,455	1,177.3
Small sawtimber stands	3,241	988.3
Poletimber stands	776	422.2
Seedling and sapling stands[2]	177	58.2
All classes	2,426	669.2

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[1] Growing stock only.

[2] Includes the volume on nonstocked and other areas.

FOREST SURVEY METHODS

The inventory of the forest resources of the Hill Country of Ohio involved an office study of aerial photographs and a field examination of randomly selected forest and nonforest plots.

The percentage of forest land in each county was obtained by placing a transparent template marked with uniformly spaced dots over aerial photographs and counting the number of dots falling on forest and nonforest areas. The percentage of forest dots in a county, multiplied by the total area gave a preliminary estimate of the forest area. This was later adjusted after field examination indicated the number of plots that had changed since the aerial photos were taken.

A selected number of forest dots were marked on the photographs. The acre surrounding each dot was examined under stereoscope and was classified by stand-size class on the basis of the height, crown width, and number of trees on the plot. Plots to be examined in the field were then randomly drawn. In drawing, greatest weight was given to the stand-size classes containing the largest timber volume. In addition, nonforest plots were selected for field examination to measure the conversion of open land to forest since the photographs were taken.

The selected field plots were marked on the photographs. Field crews located these points on the ground and established 1/5-acre circular plots for which species, size, quality, and growth of trees and other data were recorded.

The following tabulation gives the number of dots and plots examined for each of the regions.

	South-Central	Southeastern	East-Central
Number of photo dots counted for forest-area determination	25,475	18,502	31,679
Number of plots stereoscopically examined on photos	2,192	1,559	1,985
Number of forest plots field examined	[2] 1,128	[2] 883	370
Number of nonforest plots field examined	14	36	31

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[2] For a test of survey methods in these regions, various numbers and sizes of plots were taken at single locations.

ACCURACY OF DATA

Statistical analysis of the commercial forest-area and timber-volume data shows the following sampling errors[3] for each of the regions:

	COMMERCIAL FOREST AREA		GROWING-STOCK VOLUME	
	Total	Sampling error	Total	Sampling error
	Thousand acres	Percent	Million cubic feet	Percent
South-Central	1,243	± 1.6	825.4	± 2.9
Southeastern	965	± 2.2	667.6	± 3.6
East-Central	995	± 2.3	665.9	± 4.4

These estimates of sampling error do not include errors resulting from mistakes in measurement or judgment. All phases of field and office work were closely supervised to keep such errors to a minimum. Since the percentage error increases with each subdivision of the total, small acreages or volumes may have large errors and may therefore indicate only relative magnitudes.

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[3] At one standard deviation; that is, the chances are two out of three that the calculated acreages and volumes do not differ from the totals that would have been obtained by 100-percent measurement by more than the errors shown in the tabulation.

EXPLANATION OF TERMS

Forest land.--Includes (a) lands which are at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting an influence on the climate or on the water regime; (b) land from which the trees described in (a) have been removed to less than 10 percent stocking and which have not been developed for other use; (c) afforested areas.

The minimum area that qualifies as forest land is one acre. Strips of timber must be at least 120 feet wide to qualify. Conversely, clearings, streams, and unimproved treeless strips less than an acre in area or less than 120 feet in width within forest areas are classified as forest land. Improved rights-of-way such as graded roads, railroads, or transmission lines are classified as nonforest regardless of width.

Commercial forest land.--Forest land which is (a) producing, or physically capable of producing, usable crops of wood (usually sawtimber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Noncommercial forest land.--Forest land withdrawn from timber utilization through statute, ordinance, or administrative order but which otherwise qualifies as commercial forest land.

Forest types

White-red-jack pine.--Forests in which 50 percent or more of the stand is eastern white pine, red pine, or jack pine, singly or in combination. (Common associates include hemlock, aspen, birch, and maple.)

Shortleaf pine.--Forests in which 50 percent or more of the stand is shortleaf, pitch, or Virginia pines, singly or in combination. (Common associates include oak, hickory, and gum.)

Oak-pine.--Forests in which 50 percent or more of the stand is hardwoods, usually upland oaks, but in which southern pines make up 25-49 percent of the stand. (Common associates include gum, hickory, and yellow-poplar.)

Oak-hickory.--Forests in which 50 percent or more of the stand is upland oaks or hickory, singly or in combination, except where pines comprise 25-49 percent in which case the stand would be classified "oak-pine." (Common associates include yellow-poplar, elm, maple, and black walnut.)

Oak-gum.--Bottom-land forests in which 50 percent or more of the stand is tupelo, blackgum, sweetgum, or oaks, singly or in combination. (Common associates include cottonwood, willow, ash, elm, hackberry, and maple.)

Elm-ash-cottonwood.--Forests in which 50 percent or more of the stand is elm, ash, or cottonwood, singly or in combination. (Common associates include willow, sycamore, beech, and maple.)

Maple-beech.--Forests in which 50 percent or more of the stand is sugar maple or beech, singly or in combination. (Common associates include hemlock, elm, basswood, and white pine.)

Aspen.--Forests in which 50 percent or more of the stand is aspen or balsam poplar, singly or in combination.

Tree classes

Sawtimber tree.--A live softwood (coniferous) tree at least 9.0 inches d.b.h. or live hardwood tree of commercial species at least 11.0 inches d.b.h., with a sound butt log at least 8 feet long, or with at least half of the gross board-foot volume of the tree in sound material.

Poletimber tree.--A live, sound tree at least 5.0 inches d.b.h. but less than sawtimber size that gives promise of becoming a sawtimber tree.

Seedling and sapling trees.--Trees of commercial species less than 5.0 inches in diameter at breast height.

Cull tree.--A live tree at least 5.0 inches d.b.h. that does not qualify as a sawtimber or poletimber tree because of species, poor form, limbiness, rot, or other defect.

Volume estimates

Board-foot volume includes the sound volume of sawlogs in sawtimber trees to a minimum top d.i.b. of 6 inches for softwoods and 8 inches for hardwoods. Volume deductions have been made for rot, crook, and other defects. Board-foot volumes are shown in terms of the International 1/4-inch log rule, which measures the approximate yeild of green lumber cut to standard specifications.

Cubic-foot volume

Total volume includes the sound wood inside bark in both sound and cull living trees 5.0 inches d.b.h. and larger, from the stump to a minimum top diameter of 4.0 inches inside bark. It includes the upper stems of softwood trees and the upper stems and limbs of hardwoods.

Growing stock includes the volume of sound wood inside bark in the stem portion of sawtimber and poletimber trees from stump to a minimum top d.i.b. of 4 inches.

Stand-size class

Large sawtimber.--Stands having a net volume of 1,500 or more board-feet per acre in sawtimber trees, and having more than half of this volume in trees 15.0 inches d.b.h. and larger.

Small sawtimber.--Stands having a net volume of 1,500 or more board-feet per acre in sawtimber trees, and having at least half of this volume in trees smaller than 15.0 inches d.b.h.

Poletimber.--Stands failing to meet the sawtimber-stand specifications, but at least 10 percent stocked with poletimber and larger trees and with at least half the minimum stocking in poletimber trees.

Seedlings and saplings.--Stands not qualifying as either sawtimber or poletimber stands but having at least 150 seedlings and saplings of commercial species per acre.

Nonstocked.--Commercial forest land not qualifying for any other class.

Hardwood log grades

Grade 1.--Butt logs at least 13.0 inches (uppers at least 16 inches) in diameter inside bark with five-sixths of the surface on the three best faces clear of defect in not more than two cuttings, (minimum length of cutting variable, 3-7 feet, depending upon log diameter and position in tree). Minimum log length 12 feet. On the average such logs will yield at least 65 percent No. 1 common and better lumber.

Grade 2.--Logs at least 11 inches in diameter inside bark with two-thirds of the surface on the three best faces clear of defect in not more than three cuttings, (minimum length of cutting, 3 feet). Minimum log length 12 feet. On the average such logs will yield at least 40 percent No. 1 common and better lumber.

Grade 3.--Merchantable logs at least 8.0 inches in diameter inside bark at the small end, 8 feet long, and 50 percent sound which do not meet the requirements of higher grades. On the average such logs will yield less than 25 percent No. 1 common and better lumber or will be suitable for ties or timbers.

Principal Tree Species[1]

Softwoods

- Pine includes:
  - Shortleaf pine - *Pinus echinata*
  - Pitch pine - *P. rigida*
  - Virginia pine - *P. virginiana*
  - Eastern white pine - *P. strobus*
- "Other softwoods" includes:
  - Eastern redcedar - *Juniperus virginiana*
  - Eastern hemlock - *Tsuga canadensis*
  - Baldcypress - *Taxodium distichum*
  - Exotic conifers (Scotch pine, Norway spruce, etc.) -

Hardwoods

- White oak - *Quercus alba*
- Chestnut oak - *Q. prinus*
- "Other white oaks" includes:
  - Swamp white oak - *Q. bicolor*
  - Swamp chestnut oak - *Q. michauxii*
  - Post oak - *Q. stellata*
  - Overcup oak - *Q. lyrata*
  - Bur oak - *Q. macrocarpa*
  - Chinkapin oak - *Q. muehlenbergii*
- Black oak - *Q. velutina*
- Northern red oak - *Q. rubra*
- Scarlet oak - *Q. coccinea*
- "Other red oaks" includes:
  - Southern red oak - *Q. falcata*
  - Pin oak - *Q. palustris*
  - Willow oak - *Q. phellos*
  - Shingle oak - *Q. imbricaria*
- Hickory - *Carya* spp.
- White ash includes:
  - White ash - *Fraxinus americana*
  - Green ash - *F. pennsylvanica*

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[1] Source of nomenclature: Check List of the Native and Naturalized Trees of the U. S., Agriculture Handbook No. 41, Forest Service, Washington, D. C., 1953.

- Black ash includes:
  - Black ash - *F. nigra*
  - Blue ash - *F. quadrangulata*
- Slippery elm - *Ulmus rubra*
- American elm includes:
  - American elm - *U. americana*
  - Rock elm - *U. thomasii*
  - Winged elm - *U. alata*
- Cottonwood includes:
  - Eastern cottonwood - *Populus deltoides*
  - Swamp cottonwood - *P. heterophylla*
- Yellow-poplar - *Liriodendron tulipifera*
- Sugar maple includes:
  - Sugar maple - *Acer saccharum*
  - Black maple - *A. nigrum*
- Soft maple includes:
  - Boxelder - *A. negundo*
  - Red maple - *A. rubrum*
  - Silver maple - *A. saccharinum*
- Sycamore - *Platanus occidentalis*
- Beech - *Fagus grandifolia*
- Black walnut - *Juglans nigra*
- "Post species" includes:
  - Black locust - *Robinia pseudoacacia*
  - Catalpa - *Catalpa* spp.
  - Osage-orange - *Maclura pomifera*
  - Red mulberry - *Morus rubra*
  - Sassafras - *Sassafras albidum*

"Other hardwoods" includes all other commercial hardwood species.

"Noncommercial species" includes hawthorn, redbud, hophornbeam, hornbeam, serviceberry, and others.

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